

# **THE CONSTRUCTION OF GRAPHICAL CHARTS**

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The Construction of Graphical Charts by John B. Peddle

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**JOHN B. PEDDLE**

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# THE CONSTRUCTION OF GRAPHICAL CHARTS

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## PREFACE TO THE SECOND EDITION

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The increased use of charts which has been so noticeable within the few years which have elapsed since this book was published, is good evidence of the growing recognition of the value of Nomography to the engineer.

Improved methods for constructing charts are more than ever desirable, and I therefore welcome the opportunity, which comes with the publication of a new edition of the book, to add a chapter describing a method which has been very successful in my hands, and which, I trust, will be equally so in those of my readers.

The word "Determinants" in the heading for Chapter VIII is the only drawback to the process, but I hope that no one will be deterred by the name from giving the method a fair trial. I have used it for a number of years with classes in this subject, and my experience with them leads me to believe that anyone with the ordinary knowledge of mathematics which an engineer should possess can understand and apply the process with but little difficulty.

JOHN B. PEDDLE.

January, 1919.



1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in the context of public administration and financial management. The text notes that without reliable records, it is difficult to track the flow of funds and ensure that resources are being used effectively and efficiently.

2. The second part of the document addresses the challenges associated with data collection and analysis. It highlights that gathering accurate and timely data can be a complex task, often requiring the coordination of multiple departments and the use of various data sources. The text also discusses the importance of ensuring the quality and integrity of the data collected, as well as the need for robust data management systems to store and analyze the information.

3. The third part of the document focuses on the role of technology in improving data management and analysis. It discusses how modern data management tools and software can help organizations streamline their data collection processes, reduce errors, and gain valuable insights from their data. The text also touches on the importance of ensuring that these technologies are used responsibly and that data privacy and security are maintained throughout the process.

4. The fourth part of the document discusses the importance of data-driven decision-making. It argues that organizations should leverage the insights gained from their data to inform their strategic decisions and improve their overall performance. The text also notes that data-driven decision-making can help organizations identify areas for improvement and optimize their operations, leading to increased efficiency and effectiveness.

5. The fifth part of the document discusses the importance of data literacy and training. It emphasizes that all employees, regardless of their role, should have a basic understanding of data and how to use it effectively. The text also discusses the need for ongoing training and development to ensure that employees are up-to-date on the latest data management practices and technologies.

6. The sixth part of the document discusses the importance of data governance. It defines data governance as the set of processes and policies that ensure the quality, security, and availability of an organization's data. The text also discusses the importance of establishing a clear data governance framework and assigning responsibility for data management to specific individuals or departments.

7. The seventh part of the document discusses the importance of data sharing and collaboration. It argues that organizations should encourage the sharing of data across different departments and teams to facilitate collaboration and improve decision-making. The text also discusses the importance of establishing clear data sharing policies and protocols to ensure that data is shared responsibly and securely.

8. The eighth part of the document discusses the importance of data security and privacy. It emphasizes that organizations must take appropriate measures to protect their data from unauthorized access, loss, or theft. The text also discusses the importance of complying with relevant data protection regulations and ensuring that data is handled in a transparent and ethical manner.

9. The ninth part of the document discusses the importance of data archiving and backup. It emphasizes that organizations should have a robust data archiving and backup strategy in place to ensure that their data is preserved and can be recovered in the event of a disaster. The text also discusses the importance of testing backup and recovery procedures to ensure their effectiveness.

10. The tenth part of the document discusses the importance of data retention and disposal. It emphasizes that organizations should have clear policies in place regarding how long data should be retained and how it should be disposed of when it is no longer needed. The text also discusses the importance of ensuring that data disposal is done securely and in compliance with relevant regulations.

## PREFACE TO THE FIRST EDITION

Much of the work of calculation done by the engineer or designer is in the repeated application of a limited number of formulas to a variety of different conditions, which involves merely the substitution of different variables in identical equations.

Any mechanical means for performing this operation expeditiously will not only lead to a saving of time and mental wear and tear, but will also minimize the chances for error.

Such a device is the calculating chart, or nomogram, and the increasing frequency with which it is employed in the more recent technical publications is a good evidence of the growing recognition of its value.

Many excellent examples of these charts have appeared of late years and are available for use, but it is evident that to realize their full value as useful instruments the engineer should have a sufficient acquaintance with their underlying principles to construct charts suited to his individual needs.

Some of the chart forms employed to-day have been known and used for many years, but it is only within recent times that any systematic study has been made of the subject as a whole or any attempt to properly classify and correlate the different types.

In this work the French have been pioneers, and it is to one of them, Maurice d'Ocagne, that we owe what is probably the most thorough and comprehensive text on the subject, his "Traité de Nomographie."

Although books on nomography have been published in many foreign languages, there does not appear to have been anything written on the subject in English outside of a few scattered magazine articles which have covered only restricted portions of the field. Books in English on graphical calculus and computation are by no means uncommon, but this is generally looked upon as something different from nomography, although a strict line of demarcation between the two subjects would be somewhat difficult to trace.

It was with the idea of supplying an elementary English text in this neglected field that the following chapters (originally contributed in serial form to the *American Machinist*) were written.

Believing that the subject should be particularly useful to the practising engineer, who is often a trifle rusty in some parts of his mathematics, an effort has been made to simplify the mathematical treatment. A series of illustrative problems has also been worked out in detail for nearly all the chart forms which are here described, as it was thought that a study of these would afford a clearer insight into the methods and a better understanding of the difficulties likely to be encountered than would be possible from a purely theoretical analysis.

The desire for simplicity in mathematical treatment has made it necessary to restrict the application of the charts to the simpler forms of equation. Equations of the more complex types may be and have been charted, but the mathematical difficulties are such as to make a discussion of the methods used out of place in the present volume.

The processes described here, if thoroughly understood, should be sufficient to cover a large proportion of the formulas in common use. Those of my readers who wish to pursue the subject further are referred to the more ambitious works of d'Ocagne, Soreau, and others.

JOHN B. PEDDLE.

August, 1910.